

What is claimed is:

1. A liquid crystal dropping apparatus for dropping a plurality of liquid crystal drops in a predetermined pattern on a substrate, said liquid crystal dropping apparatus comprising:

a container that contains a liquid crystal;

a liquid crystal dispensing device that drops the liquid crystal contained in the container on the substrate; and

a moving device that moves the liquid crystal dispensing device and the substrate relative to each other;

wherein the liquid crystal dispensing device includes: a sucking means for taking out from the container a quantity of the liquid crystal corresponding to a quantity of the liquid crystal to be dropped; a temporary storage means for temporarily storing the liquid crystal taken out from the container by the sucking means.; and a discharge means for discharging the liquid crystal temporarily stored by the temporary storage means.

2. The liquid crystal dropping apparatus according to claim 1, wherein the liquid crystal dispensing device includes a plurality of temporary storage means; and the liquid crystal dropping apparatus further comprises a locating means that locates the sucking means and the discharge means relative to the plurality of temporary storage means such that a liquid crystal sucking operation of the sucking means and a liquid crystal discharging operation of the discharge means are simultaneously performed.

3. The liquid crystal dropping apparatus according to claim 2, wherein the plurality of temporary storage means of the liquid crystal dispensing device include a plurality of storage chambers formed in a rotary member that rotates relative to a stationary member; the

sucking means includes a suction port formed in the stationary member, and a sucking mechanism for taking out the liquid crystal through the suction port into each of the storage chambers of the rotary member; the discharge means includes a discharge port formed in the stationary member, and an extruding mechanism for extruding the liquid crystal from each of the storage chambers of the rotary member through the discharge port; and the locating means includes a drive mechanism for rotating the rotary member relative to the stationary member to locate each of the storage chambers of the rotary member at a position corresponding to the suction port of the stationary member and at a position corresponding to the discharge port of the stationary member.

4. The liquid crystal dropping apparatus according to claim 3, wherein the sucking mechanism of the sucking means and the extruding mechanism of the discharge means include plungers fitted for reciprocation in the storage chambers of the rotary member, and a plunger moving mechanism for reciprocating the plungers.

5. The liquid crystal dropping apparatus according to claim 4, wherein the plunger moving mechanism includes a cam for reciprocating the plungers in accordance with positions respectively corresponding to the suction port and the discharge port.

6. The liquid crystal dropping apparatus according to claim 4, wherein the plunger moving mechanism includes a cylinder actuator for reciprocating the plunger in accordance with positions respectively corresponding to the suction port and the discharge port.

7. The liquid crystal dropping apparatus according to claim 1, further comprising:

a position sensor that detects a positional relation between the liquid crystal dispensing device and the substrate; and

a controller that controls timing of a liquid crystal discharging operation of the liquid crystal dispensing device on the basis of position information about the positional relation between the liquid crystal dispensing device and the substrate provided by the position sensor and on the basis of dropping position information about predetermined positions on the substrate where the liquid crystal is to be dropped.

8. The liquid crystal dropping apparatus according to claim 1, further comprising a controller that controls the moving device and the liquid crystal dispensing device on the basis of a relative moving speed between the liquid crystal dispensing device and the substrate and on the basis of a discharge time interval at which the liquid crystal is discharged by the liquid crystal dispensing device, the relative moving speed and the discharge time interval being determined beforehand on the basis of a drop position interval between positions where the liquid crystal is to be dropped on the substrate.

9. The liquid crystal dropping apparatus according to claim 1, further comprising a discharge adjusting device that adjusts the quantity of the liquid crystal to be discharged by the liquid crystal dispensing device.

10. A liquid crystal dropping method of dropping a plurality of liquid crystal drops on a substrate in a predetermined pattern by moving a liquid crystal dispensing device, which drops a liquid crystal, and the substrate relative to each other, said liquid crystal dropping method comprising:

a sucking step of taking out a quantity of the liquid crystal corresponding to a quantity of the liquid crystal to be dropped, from a container storing the liquid crystal into the liquid crystal dispensing device;

a temporarily storing step of temporarily storing

the liquid crystal, which is taken out from the container in the sucking step, in the liquid crystal dispensing device; and

a discharging step of discharging the liquid crystal, which is temporarily stored in the temporarily storing step, onto the substrate by the liquid crystal dispensing device.

11. The liquid crystal dropping method according to claim 10, wherein the liquid crystal dispensing device includes a plurality of temporary storage means for temporarily storing the liquid crystal taken out in the sucking step; and the liquid crystal taken out in the sucking step is sequentially stored by the plurality of temporary storage means to simultaneously perform the sucking step and the discharge step.

12. The liquid crystal dropping method according to claim 10, further comprising:

a detecting step of detecting a positional relation between the liquid crystal dispensing device and the substrate; and

a determining step of determining timing of a liquid crystal discharging operation of the liquid crystal dispensing device on the basis of position information about the positional relation detected in the detecting step and on the basis of drop position information about predetermined positions on the substrate where the liquid crystal is to be dropped.

13. The liquid crystal dropping method according to claim 10, further comprising a determining step of determining a relative moving speed between the liquid crystal dispensing device and the substrate, and a discharge time interval at which the liquid crystal is discharged by the liquid crystal dispensing device, on the basis of a drop position interval between positions where the liquid crystal is to be dropped on the substrate;

wherein the liquid crystal dispensing device and the substrate are moved relative to each other at the relative moving speed determined in the determining step; and the liquid crystal is dropped by the liquid crystal dispensing device at the discharge time interval determined in the determining step.

14. The liquid crystal dropping method according to claim 10, further comprising a discharge adjusting step of adjusting the quantity of the liquid crystal to be discharged by the liquid crystal dispensing device.